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Pesticide Fact Sheet Number 150: Chlorpropham

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16. Abstract (Limit: 200 words)

This document contains up-to-date chemical information, including a summary of the Agency's regulatory position and rationale, on a specific pesticide or group of pesticides. A Fact Sheet is issued after one of the the following actions has occurred.

1. Issuance or reissuance of a registration standard,
2. Issuance of each special review document,
3. Registration of a significantly changed use pattern,
4. Registration of a new chemical, or
5. An immediate need for information to resolve controversial issues relating to a specific chemical or use pattern.

17. Document Analysis a. Descriptors

Pesticides, regulations, Chemical Information Fact Sheet, Use Patterns, science findings.

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

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Office of Pesticide Programs (TS-76 C)
Washington, DC 20460

EPA

Pesticide Fact Sheet

Name of Chemical: Chlorpropham
Reason for Issuance: Registration Standard
Date Issued: DEC 23 1987
Fact Sheet Number: 150

1. DESCRIPTION OF CHEMICAL

Generic Name: Isopropyl N-(3-chlorophenyl) carbamate

Common Name: Chlorpropham

Trade Names: Beet-Kleen, Furloe, Sprout Nip, Spud-Nic, Taterpex, Triherbicide-CIPC, Unicrop CIPC, Chloro IPC

EPA Shaughnessy Code: 018301

Chemical Abstracts Service (CAS) Number: 101-21-3

Year of Initial Registration: 1962

Pesticide Type: Herbicide and plant growth regulator

Pests Controlled: Suckers on tobacco plants, sprouting in stored potatoes, broadleaf weeds and grasses.

Chemical Family: Carbamate

U. S. and Foreign Producers: Pennwalt Holland B.V. (Netherlands), PPG Industries, Inc., Chemical Div.-U.S., Universal Crop Protection Ltd.

2. USE PATTERNS AND FORMULATIONS

Application Sites: Terrestrial food and nonfood crop and ornamentals.

Types and Methods of Application: Chlorpropham is a selective preplant incorporated, preemergence, and postemergence herbicide and plant growth regulator. Chlorpropham may be applied by ground or by air.

Application Rates: Altalta 1-6 pounds active ingredient per acre (lb ai/A); beans (lima and snap) 4 lb ai/A; perennial grasses (seed crop) no rate given; flowers (annual, biennual, perennial (bulbs)) 4-6 lb ai/A; garlic 2-4 lb ai/A; spinach 1-2 lb ai/A; clovers 2-4 lb ai/A; onions 4-8 lb ai/A; ornamentals 4-8 lb ai/A; safflower 3-6 lb ai/A; blackberries, raspberries 6 lb ai/A; blueberries 8-12 lb ai/A; cranberries 10-20 lb ai/A; southern peas 4-6 lb ai/A; soybeans 2-4 lb ai/A. sugarbeet (seed crop) 3-4 lb ai/A; and tomatoes 4 lb ai/A.

Types of Formulations: 98% Technical Grade Active Ingredient (TGAI); 5%, 10.3% and 20% active ingredient (ai) granule (G); 11.9% ai, 15% ai, 22.2% ai, 25% ai, 36% ai and 47% ai emulsifiable concentrate (EC); 46% ai, 46.5% ai, 49.65% ai, 78.4% ai and 78.5% ai liquid ready to use (RTU).

Usual Carrier: Water

3. SCIENCE FINDINGS

Summary Science Statement: The current data base for chlorpropham is insufficient with extensive data gaps in all areas.

Insufficient data are available to permit a reliable prediction of the leaching potential of chlorpropham. Taking into account chlorpropham's high solubility and relative stability in water, in addition to the known mobility of a related chemical, propham, chlorpropham can be expected to leach and might enter ground water.

Chemical Characteristics: T = Technical
P = Pure Active Ingredient

Physical state - (T) fused solid

Color - (T) off white to light brown

Density, bulk density, or - (T) ca. 1.2 gram/milliliter
Specific gravity (P) 1.180 at 30°C

Solubility - (P) 102.5 parts per million (ppm) in water, 24°C

Melting point - (T) 37-40°C
(P) 39° C

Toxicology Characteristics

Acute Toxicity - No acceptable data are available on the acute toxicity, primary eye irritation or dermal irritation.

Chronic and Subchronic Toxicity - No available data are available on the subchronic toxicity, oncogenicity, or metabolism of chlorpropham. The available data on teratogenicity and reproduction are acceptable.

Teratogencity:

Rat:
Maternal Toxic No Observed Effect Level (NOEL) = 100 mg/kg/day
This is the dose level that produces no observable effects in pregnant rats.
Developmental Toxic NOEL = 350 mg/kg/day

Rabbit:
Maternal Toxic NOEL = 250 mg/kg/day
This is the dose level that produces no observable effects in the embryo or fetuses of rabbits.
Developmental Toxic NOEL = 125 mg/kg/day

Reproduction:

Rat:
Reproductive NOEL $\geq$ 10000 ppm (highest dose tested (HDT))
Systemic NOEL = 1000 ppm (lowest dose tested (LDT))

Mutagenicity - The single acceptable mutagenicity study (gene mutation) was negative.

Physiological and Behavioral Characteristics

Translocation - Chlorpropham may be translocated from the roots into the shoots.

Mechanism of Pesticide Action - Chlorpropham suppresses plant transpiraton and respiration, and inhibits root and epicotyl growth.

Metabolism and Persistence in Plants and Animals - The metabolism of chlorpropham in growing plants has been adequately described. The herbicide is translocated from roots into shoots and residues include chlorpropham, isopropyl 3-chloro-6-hydroxycarbanilate, isopropyl 3-chloro-4-hydroxycarbanilate, 1-hydroxy-2-propyl-3-chlorocarbanilate (isopropyl-OH-CIPC), isopropyl 3-chloro-2-hydroxycarbanilate, and 3-chloroaniline. Additional data are required regarding the metabolism of chlorpropham in stored potato tubers treated postharvest and in livestock (ruminants and poultry).

Environmental Characteristics

Available data are insufficient to fully assess the environmental fate of chlorpropham. The data requirement for a hydrolysis study has been satisfied.

A hydrolysis study showed that chlorpropham is relatively stable in sterile water in the dark. After 32 days in aqueous buffered solutions at pH 4, 7, and 9 held in the dark at 40°C, about 90% of the applied chlorpropham remained undegraded.

The remaining environmental fate studies are inadequate, but supplementary data indicate that chlorpropham (parent compound) dissipates with a half-life of <14 days in the upper 3 inches of silty clay loam and silt loam soils regardless of site or application procedure (incorporated or surface-applied).

Fish accumulation data indicate that chlorpropham bioaccumulated in the skinless fillet of a bluegill sunfish to 100 times the levels in water.

Supplementary data indicate that chlorpropham accumulated in rotational crops planted 12 months after treatment.

Reentry data are not required because available toxicological data do not indicate a need for reentry data.

The following studies are required: photodegradation in water and on soil, aerobic and anaerobic soil metabolism, leaching and absorption/desorption, volatility (lab), field dissipation, irrigated crops and fish accumulation. Additional rotational crop studies (confined and field) are also required.

The Agency is concerned about pesticide residues reaching ground water. The potential for chlorpropham to reach ground water cannot be assessed since no leaching data are available. Taking into consideration chlorpropham's high solubility and its relative stability in water and the mobility of a related chemical, propham, chlorpropham can be expected to leach and thus might enter ground water.

Chlorpropham is the subject of a ground water DCI notification and additional data are needed to fully characterize the potential for it to enter ground water.

Ecological Characteristics

Hazards to Fish and Wildlife - A supplementary study indicates that chlorpropham is practically nontoxic to water fowl (mallard median lethal dose (LD_{50}) is greater than 2000 milligrams per kilogram (mg/kg)).

Core studies indicate that chlorpropham is moderately toxic to coldwater and warmwater freshwater fishes (bluegill sunfish median lethal concentration (LC_{50})= 6.3-6.8 parts per million (ppm); rainbow trout LC_{50} = 3.02-5.7 ppm).

Tolerance Assessment

Tolerances have been established for residues of chlorpropham in or on a variety of raw agricultural plant commodities, meat, milk, and eggs (40 CFR 180.181 and 40 CFR 180.319).

Results of Tolerance Assessment - Due to the lack of acceptable plant and animal (livestock) metabolism data, storage stability data, and residue data, a conclusive tolerance reassessment cannot be conducted.

Based on chronic effects observed in a two-generation rat reproduction study (slow weight gain; microscopic lesions in kidneys, spleen, liver and marrow; gross spleenic lesions; and organ weight changes in the liver and spleen) a Provisional Acceptable Daily Intake (PADI) has been

established at 0.2 mg/kg/day based on a NOEL of 50 mg/kg/day and an uncertainty factor of 300. [An uncertainty factor of 100 was used to account for the inter -and intraspecies difference and a factor of 3 was used to account for the inadequate data base for chronic toxicity].

The Theoretical Maximum Residue Contribution (TMRC) to the human diet was based upon published tolerances. The TMRC for 22 subgroups of the U.S. population ranged from 0.0182-0.1154 mg/kg/day which occupies 9-58% of the PADI. Upon receipt of the requested residue chemistry and toxicology data, the chlorpropham tolerances will be reassessed.

Reported Pesticide Incidents

There are no Pesticide Incident Monitoring System (PIMS) reports or accident reports concerning chlorpropham.

4. SUMMARY OF REGULATORY POSITION AND RATIONALE

Warning Statements Required on Labels:

Manufacturing-Use Products

Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or public waters unless this product is specifically identified and addressed in an NPDES permit. Do not discharge effluent containing this product into sewer systems without previously notifying the sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of the EPA.

End-Use Products (Terrestrial Food and Non-food Crop)

Do not apply directly to water or wetlands (swamps, bogs, marshes, potholes). Do not apply where runoff is likely to occur. Do not contaminate water by cleaning of equipment or disposal of wastes.

5. SUMMARY OF MAJOR DATA GAPS:

DATA	DUE DATE
PRODUCT CHEMISTRY	6 to 15 Months

RESIDUE CHEMISTRY	
Nature of Residue (metabolism)	18 Months
Residue Analytical Method	15 Months
Storage Stability	18 Months
Magnitude of the Residue for Each Food Use	18 to 24 Months
Magnitude of the Residue in Drinking and Irrigation water	15 Months
TOXICOLOGY	
Acute Oral Toxicity (rat)	9 Months
Acute Dermal Toxicity (rabbit)	9 Months
Acute Inhalation Toxicity (rat)	9 Months
Primary Eye Irritation	9 Months
Primary Dermal Irritation	9 Months
Dermal Sensitization	9 Months
90 Day Feeding (rodent)	15 Months
(non-rodent)	18 Months
21 Day Dermal (rabbit)	12 Months
Smoke Inhalation	15 Months
Chronic Toxicity (rodent and non-rodent)	50 Months
Oncogenicity (rat and mouse)	50 Months
Structural Chromosomal Aberration	12 Months
Other Mechanisms Mutagenicity	12 months
General Metabolism	24 months
ENVIRONMENTAL FATE	
Photodegradation (water and soil)	9 Months
Metabolism (aerobic and anaerobic soil)	27 Months
Leaching and Adsorption/Desorption	7 Months
Dissipation (soil)	27 Months
(soil, long-term)	Reserved
Accumulation	
Rotational Crops (confined)	39 Months
Rotational Crops (field)	Reserved
Irrigated Crops	39 Months
In Fish	12 Months
WILDLIFE AND AQUATIC ORGANISMS	
Residue Monitoring	9 Months
Acute Avian Oral Toxicity	9 Months
Avian Subacute Dietary	9 Months
Freshwater Fish Toxicity	9 Months
Acute Toxicity to Freshwater Invertebrate	9 Months

Acute Toxicity to Estuarine and Marine Organisms	12 Months
Fish Early Life Stage and Aquatic Invertebrate Life Cycle	15 Months
Fish Life Cycle	27 Months

6. CONTACT PERSON AT EPA:

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DISCLAIMER: The information presented in this Pesticide Fact Sheet is for informational purposes only and may not be used to fulfill data requirements for pesticide registration and reregistration.